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referred to was dredged by Count Pourtales in the Florida Gulf Stream a few years ago. When the shells of Florida are sufficiently investigated, so that a check-list may be made, it may somewhat affect this comparison, but other Scutibranchiate species may be found on this coast, so that it is highly probable that the above comparison will remain substantially correct.—R. E. C. STEARNS.

COLLURIO LUDOVICIANUS.—A male in fine plumage, now in my possession, was shot in West Newton, Mass., Oct. 21, 1872, by Mr. Joseph S. Maynard. Allowing the existence of two varieties, if not species, I think this specimen approaches nearer to *Ludovicianus* than *excubitoroides*. Is not this the first recorded instance of the authentic occurrence of this southern and western bird in the coast states, or at least near the coast, north of Virginia if not the Carolinas?—H. A. PURDIE, *November*, 1872.

RACCOON FOX.—In the June number of the *AMERICAN NATURALIST* (page 362), I find a notice that one of these little animals had been killed, and another seen in Fairfax County, Ohio, and it is remarked, in connection with its northern locality, that the specimen obtained was furred instead of haired. The range of the *Bassaris astuta* is much greater than your correspondent supposes, unless there be two varieties or two species of this genus. They are found, I believe, throughout California, as far north as the Klamath River, Lat. 41° N., where, in 1852, I purchased from an Indian a breech clout made of seven skins, the fur of which was very soft and beautiful. I heard at the time that the "Raccoon Fox," as the miners called it, had occasionally been tamed and employed to destroy mice and other vermin. In Cooper and Suckley's *Natural History of Washington Territory*, etc., p. 114, your correspondent will find a reference on my authority to the above *habitat*. I doubt if it extends into Oregon, as the Siskiyou Mountains, parallel of 42° N., form a geographical boundary for several species of animals, birds and plants.

The specimens in question were probably escapes, brought either from Kansas or California by some returned miner or emigrant.—GEORGE GIBBS, *New Haven*.

GEOLOGY.

ON A NEW SUB-CLASS OF FOSSIL BIRDS (ODONTORNITHES).—The remarkable extinct birds with biconcave vertebræ (*Ichthyornidæ*),

recently described by the writer from the upper Cretaceous shale of Kansas,* prove on further investigation to possess some additional characters, which separate them still more widely from all known recent and fossil forms. The type species of this group, *Ichthyornis dispar* Marsh, has well developed *teeth in both jaws*. These teeth are quite numerous, and implanted in distinct sockets. They are small, compressed and pointed, and all of those preserved are similar. Those in the lower jaws number about twenty in each ramus, and are all more or less inclined backward. The series extends over the entire upper margin of the dentary bone, the front tooth being very near the extremity. The maxillary teeth appear to have been equally numerous, and essentially the same as those in the mandible.

The skull is of moderate size, and the eyes placed well forward. The lower jaws are long and slender, and the rami are not closely united at the symphysis. They are abruptly truncated just behind the articulation for the quadrate. This extremity, and especially its articulation, is very similar to that in some recent aquatic birds. The jaws were apparently not encased in a horny sheath.

The scapular arch, and the bones of the wings and legs, all conform closely to the true ornithic type. The sternum has a prominent keel, and elongated grooves for the expanded coracoids. The wings are large in proportion to the legs, and the humerus has an extended radial crest. The metacarpals are united, as in ordinary birds. The bones of the posterior extremities resemble those in swimming birds. The vertebræ are all biconcave, the concavities at each end of the centra being distinct, and nearly alike. Whether the tail was elongated cannot at present be determined, but the last vertebra of the sacrum is unusually large.

This bird was fully adult, and about as large as a pigeon. With the exception of the skull, the bones do not appear to have been pneumatic, although most of them are hollow. The species was carnivorous and probably aquatic.

When the remains of this species were first described, the portions of lower jaws found with them were regarded by the writer as Reptilian; the possibility of their forming part of the same skeleton, although considered at the time, was not deemed sufficiently strong to be placed on record. On subsequently removing the surrounding shale, the skull and additional portions of both

* American Journal Science Arts, vol. iv, p. 344, Oct. 1872, and vol. v, p. 74, Jan., 1873.

jaws were brought to light, so that there cannot now be a reasonable doubt that all are parts of the same bird. The possession of teeth and biconcave vertebræ, although the rest of the skeleton is entirely avian in type, obviously implies that these remains cannot be placed in the present groups of birds, and hence a new subclass, *Odontornithes*, is proposed for them. The order may be called *Ichthyornithes*.

The species lately described by the writer as *Ichthyornis celer*, also had biconcave vertebræ, and probably teeth. It proves to be generically distinct from the type species of this group, and hence may be named *Apatornis celer* Marsh. It was about the same size as *Ichthyornis dispar*, but of more slender proportions. The geological horizon of both species is essentially the same. The only remains of them at present known are in the museum of Yale College.

The fortunate discovery of these interesting fossils is an important gain to palæontology, and does much to break down the old distinctions between birds and reptiles, which the Archæopteryx has so materially diminished. It is quite probable that that bird, likewise, had teeth and biconcave vertebræ, with its free metacarpals and elongated tail. — O. C. MARSH, *reprinted from advance sheets of the American Journal of Science and Arts for February, 1873.*

ANTHROPOLOGY.

CHANGE IN THE FORM OF SKULLS WITH AGE.—The hypothesis, at one time so universally held, says Virchow, that all longheaded skulls were Celtic, may now be taken as an example of how easy it is to overstep the mark, and of the caution that should be exercised in anthropological inquiries. Any conclusions that may be drawn from the forms of skulls of early times are quite open to question. The influence of culture has hitherto been too little considered. Schaffhausen has observed that the growth of the skull continues to a later period than was formerly supposed, and that it increases in breadth in old age. This explains how it happens that so many more of the long and narrow skulls have been traced to earlier times, and that the proportion of the broader ones increases in the quaternary epoch. In the case of the broad skulls the brain has usually attained fuller development, while the most remarkable long and narrow skulls are to be met with among